

1. On the Fresh-water Fishes of the Island of Trinidad, based on the collection, notes, and sketches made by Mr. Lechmere Guppy, Junr. By C. TATE REGAN, B.A., F.Z.S.

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(Plates XXI.—XXV.\*)

The Fresh-water Fishes of the Island of Trinidad, West Indies, formed the subject of an important memoir by Dr. Th. Gill † in 1858. The following is a list of the species which he described, together with the names used to designate them in the present paper:—

<i>Polycentrus tricolor Gill</i>	=	<i>Polycentrus schomburgkii.</i>
<i>Ctenogobius fasciatus Gill</i>	=	<i>Gobius fasciatus.</i>
<i>Cychlasoma pulchrum Gill</i>	=	<i>Acara pulchra.</i>
" <i>tænia Benn.</i>	=	<i>Cichlosoma bimaculatum.</i>
<i>Crenicichla frenata Gill</i>	=	<i>Crenicichla saxatilis.</i>
<i>Pimelodotus wilsoni Gill</i>	=	<i>Pimelodus wilsoni.</i>
<i>Callichthys kneri Gill</i>	=	<i>Callichthys kneri.</i>
<i>Hoplosternum lævigatum Val.</i>	=	" <i>littoralis.</i>
" <i>stewardii Gill</i>	=	" <i>thoracatus.</i>
<i>Hoplosoma æneum Gill</i>	=	<i>Corydoras æneus.</i>
<i>Hypostomus robinii C. &amp; V.</i>	=	<i>Plecostomus guacari.</i>
<i>Ancistrus guacharote C. &amp; V.</i>	=	<i>Ancistrus trinitatis.</i>
<i>Macrodon ferox Gill</i>	=	<i>Macrodon trahira.</i>
<i>Erythrinus cinereus Gill</i>	=	<i>Erythrinus unitæniatus.</i>
<i>Pœcilurichthys brevoortii Gill</i>	=	<i>Tetragonopterus maculatus.</i>
" <i>tæniurus Gill</i>	=	" <i>tæniurus.</i>
" <i>pulcher Gill</i>	=	<i>Chirodon pulcher.</i>
" <i>unilineatus Gill</i>	=	<i>Tetragonopterus unilineatus.</i>
<i>Curimatus argenteus Gill</i>	=	<i>Curimatus argenteus.</i>
<i>Stewardia albipinnis Gill</i>	} =	<i>Corynopoma riisei.</i>
<i>Corynopoma riisei Gill</i>		
" <i>veedonii Gill</i>		
<i>Nematopoma searlesii Gill</i>		

In Dr. Günther's Catalogue of Fishes (1859–1870) a little Cyprinodont was described from Trinidad under the name *Girardinus guppyi* ‡, and in 1873 and 1874 the late Prof. Lütken § published some critical notes on the Siluroid and Characinid fishes described by Dr. Gill.

The present paper deals with a collection made by Mr. Lechmere Guppy, Junr., who has followed out a suggestion made by Mr. Boulenger to such good purpose that he has sent to the British Museum a series of well-preserved specimens representing thirty-five species, including all but three of those which have previously been described from the island. He has also sent

\* For explanation of the Plates, see p. 393.

† Ann. Lyc. N. York, vi. pp. 363–430.

‡ This species was named after Mr. L. Guppy, Senr.

§ Vid. Medd. Kjöbenhavn, 1873, pp. 214–217, and 1874, pp. 220–240.

notes on the habits and the life-coloration of these fishes, and a set of beautifully executed water-colour drawings made by himself, some of which have been reproduced by Mr. Green to illustrate this paper.

Mr. Guppy's collecting was done in the northern part of the island, and most of the fish were taken on the Streatham Lodge Estate in muddy streams draining into the Caroni River, flowing through narrow ravines in which there is a considerable growth of rank grass. In times of drought these streams form a series of almost isolated pools. The Caroni River has a fair current; during heavy rains it overflows its banks and the surrounding country is swamped; floods extending for miles round sometimes occur in the wet season, the egress of water from the river being checked by the high tides caused by the quantity of water poured into the Gulf of Paria by the Orinoco.

Mr. A. J. Pasea, of Streatham Lodge Estate, accompanied Mr. Guppy on all his expeditions, put his seine nets and trained labour at his disposal, and gave him the benefit of his experience as to the best localities to fish in, while Mr. Balfour, of Frederick Estate, lent him a boat for use on the Caroni. Assistance was also given in various ways by Dr. Tulloch, Sir C. C. Knollys, the Hon. S. W. Knagg, and Sir A. Maloney. To all of these gentlemen, and especially to Mr. Pasea, Mr. Guppy wishes to express his gratitude.

I have prepared a key to the fishes which have so far been recorded from the fresh-waters of Trinidad, and I follow it with a list arranged in systematic order, with extracts from Mr. Guppy's notes, and with full descriptions of those species which are not well known. Whenever possible I have placed the extracts from Mr. Guppy's notes in inverted commas.

*Synopsis of the Species of Fresh-water Fishes so far recorded  
from Trinidad.*

I. Body scaly; ventral fins present, abdominal; fins without spines.

A. No adipose fin.

1. Mouth small; teeth unicuspid.

Anal fin with 15-17 rays ..... 25. *Haplochilus harti*.

Anal fin with 8-9 rays ..... 26. *Girardinus guppyi*.

2. Mouth large; teeth conical.

Dorsal fin with 13-15 rays. 38-40 scales in a longitudinal series ..... 1. *Macodon trahira*.

Dorsal fin with 10-11 rays. 32-33 scales in a longitudinal series ..... 2. *Erythrinus uniteniatus*.

3. Mouth small; teeth compressed, notched or denticulated.

3. *Corynopoma risii*.

B. An adipose fin.

1. Teeth well developed, compressed, notched or denticulated.

a. Præmaxillary teeth in a double series.

a. Lateral line complete.

\* Depth of body 3-3½ in the length.

Diameter of eye ⅔ the length of head (in specimens of 60-65 mm.) ..... 4. *Tetragonopterus tenuis*.

Diameter of eye ⅔-½ the length of head (in specimens of 65-85 mm.) ..... 5. *T. guppyi*.

- \*\* Depth of body  $2-2\frac{2}{3}$  in the length 6. *T. maculatus*.  
 β. Lateral line wanting posteriorly ... 7. *T. unilineatus*.  
 b. Præmaxillary teeth in a single series . 8. *Chirodon pulcher*.  
 2. Teeth wanting ..... 9. *Curimatus argenteus*.
- II. Body elongate, scaly; no ventral fins; no dorsal; anal very long..... 10. *Carapus fuscatus*.
- III. Body naked or with bony plates ventral fins present, abdominal; an adipose fin.
- A. Body naked; adipose fin normal.
1. Gill-membranes with free posterior edge, not united to the isthmus.
- a. Adipose fin short.
- Teeth on the palate in two small separate patches. 11. *Arius spixii*.  
 Teeth on the palate forming a broad continuous band. 12. *A. herzbergii*.
- b. Adipose fin very long ..... 13. *Pimelodus wilsoni*.
2. Gill-membranes broadly united to the isthmus.
- Caudal fin deeply forked ..... 14. *Pseudauchenipterus guppyi*.  
 Caudal fin obliquely truncate ..... 15. *Parauchenipterus pascæ*.
- B. Body covered on each side with 2 series of lamellæ, overlapping on the mid-lateral line; adipose fin with a movable spine.
1. Two pairs of nuchal plates between parieto-occipital and basal shield of spine of dorsal fin.
- a. Coracoids not exposed on ventral surface. 16. *Callichthys kneri*.
- b. Coracoids exposed ventrally.
- A median series of plates extending the whole of the distance from dorsal to adipose fin ..... 17. *C. littoralis*.  
 A median series of plates in front of the adipose fin, not extending forward to the dorsal..... 18. *C. thoracatus*.
2. Parieto-occipital produced into a process which reaches the basal shield of the spine of dorsal fin. 19. *Corydoras æneus*.
- C. Body covered on each side by 4 or 5 series of bony plates; adipose fin with a movable spine.
1. Upper surface of snout covered with small granular plates.
- a. Interoperculum little movable, not notably spinate or bristly.
- Eye moderate; snout ovate ..... 20. *Plecostomus guacari*.  
 Eye small; snout broadly rounded ..... 21. *P. robinii*.
- b. Interoperculum freely movable, with a bunch of slender spines with hooked apices, which can be everted ..... 22. *Ancistrus trinitatis*.
2. Upper surface of snout naked, bearing prominent fleshy tentacles in the males ..... 23. *Xenocara cirrhosum*.
- IV. Body elongate, eel-shaped, naked; no paired fins; gill-openings represented by a single ventral slit. 24. *Symbranchus marmoratus*.
- V. Body elongate, enclosed in a series of bony rings; no ventral fins; snout produced, tubiform ..... 27. *Doryichthys lineatus*.
- VI. Body scaly; anterior part of dorsal fin formed of spines or a separate anterior dorsal formed of spines or of simple flexible rays.
- A. Ventrals separate, each formed of an outer spine and of five branched rays.
1. A single dorsal fin.
- Dorsal XVI-XVIII 7-8. Anal XIII-XIV 7-8... 33. *Polycentrus schomburgkii*.  
 Dorsal XVII-XX 13-16. Anal III 8-10 ..... 34. *Crenicichla saxatilis*.  
 Dorsal XIII-XIV 9-11. Anal III 7-9 ..... 35. *Acara pulchra*.  
 Dorsal XIV-XV 9-11. Anal IV 8-9 ..... 36. *Cichlosea bimaculatum*.

## 2. Two dorsal fins.

## a. Anterior dorsal of 4 spines.

## α. Jaws with bands of small pointed teeth.

28. *Agonostomus monticola*.

## β. Jaws with minute ciliiform teeth\*; anal fin usually with III 8 rays; 32 to 36 scales in a longitudinal series.

Second dorsal with a series of small scales behind each ray, otherwise naked ..... 29. *Mugil brasiliensis*.Second dorsal covered with small scales ..... 30. *M. trichodon*.

## b. Anterior dorsal of 7 or 8 spines; anal with 3 spines, the second and third strong †.

65-75 scales in a longitudinal series; second and third anal spines subequal ..... 31. *Centropomus undecimalis*.50-60 scales in a longitudinal series; second anal spine considerably longer than third ..... 32. *C. ensiferus*.

## c. Anterior dorsal of 6 or 7 slender flexible spines; anal with a single feeble spine ‡.

Vomer toothed; lower jaw projecting; scales small.

37. *Philypnus dormitator*.

Vomer toothless; jaws equal anteriorly; scales rather large.

38. *Dormitator maculatus*.

## B. Ventrals united to form a disc.

## 1. Jaws with bands of small pointed teeth and an outer series of larger teeth.

32 scales in a longitudinal series ..... 39. *Gobius fasciatus*.60-75 scales in a longitudinal series ..... 40. *Chonophorus banana*.2. Teeth in the jaws in a single series ..... 41. *Evorthodus breviceps*.

\* Although only *M. brasiliensis* and *M. trichodon* have been actually recorded from Trinidad, there can be but little doubt that all the species of *Mugil* which occur on the Atlantic coasts of America are to be obtained there.

These may be distinguished as follows:—

## I. Second dorsal naked except for a series of small scales behind each ray; anal with III 8 rays (rarely III 7 or III 9).

38 to 42 scales in a longitudinal series ..... *cephalus* L.32 to 36 scales in a longitudinal series ..... *brasiliensis* Ag.

## II. Second dorsal covered with small scales.

## A. Anal with III 9 rays (rarely III 8).

42 to 45 scales in a longitudinal series ..... *incilis* Hancock.36 to 39 scales in a longitudinal series ..... *curema* C. & V.

## B. Anal with III 8 rays (rarely III 7 or III 9); 32 to 36

scales in a longitudinal series ..... *trichodon* Poey.

† Probably all the Atlantic species of *Centropomus* occur in the rivers of Trinidad. They may be distinguished thus:—

## I. Anal with III 7 rays, the second and third spines subequal.

*pectinatus* Poey.

## II. Anal with III 6 rays.

A. Second and third anal spines subequal; 65 to 75 scales in a longitudinal series ..... *undecimalis* Bl.

## B. Second anal spine longer than third.

75 to 90 scales in a longitudinal series ..... *parallelus* Poey.50 to 60 scales in a longitudinal series ..... *ensiferus* Poey.

‡ Allied to *Philypnus dormitator* and certainly to be found in the rivers of Trinidad are two species which may be distinguished thus:—

Vomer toothless; lower jaw projecting; scales small.

Dorsal with VI, I 8 rays ..... *Eleotris pisonis* Gm.Dorsal with VII, I 10 rays ..... *E. guavina* C. & V.

1. *MACRODON TRAHIRA* Spix.

"Guabin."

"Much appreciated as an article of food, although rather bony ; they are purchased readily by the labouring classes.

"A very small specimen (30 mm.) was caught at Cumuto ; it was skimming along the top of the water when captured. Examples of this size can vibrate the pectoral fins with extreme rapidity ; they often rest as if asleep, hence the name 'Dormeuse.'

"Colour : greenish, a more or less distinct blackish longitudinal band and irregular cross-bars ; vertical fins with series of dark spots."

*Hab.* Brazil ; Guiana ; Venezuela.

2. *ERYTHRINUS UNITÆNIATUS* Spix.

"Yarrow."

"Found all over the island in muddy streams.

"Colour : greenish or olivaceous ; sometimes a dark longitudinal lateral stripe ; fins pink."

*Hab.* Brazil ; Guiana ; Venezuela.

Genus *CORYNOPOMA*.

*Stevardia* Gill, Ann. Lyc. N. York, vi. 1858, p. 424.

*Corynopoma* Gill, t. c. p. 425 ; Günth. Cat. Fish. v. p. 287 (1864).

*Nematopoma* Gill, t. c. p. 428.

This genus appears to be allied to *Tetragonopterus*, from which it differs in the more posterior position of the dorsal fin, the absence of an adipose fin, and in the curious sexual characters.

3. *CORYNOPOMA RIISEI*. (Plate XXII. fig. 3.)

*Stevardia albipinnis* Gill, Ann. Lyc. N. York, vi. 1858, p. 425.

*Corynopoma riisei* Gill, t. c. p. 426 ; Günth. Cat. Fish. v. p. 287 (1864) ; Lütken, Vid. Med. 1874, p. 223.

*Corynopoma veedoni* Gill, t. c. p. 427 ; Günth. l. c.

*Nematopoma searlesii* Gill, t. c. p. 429.

*Corynopoma albipinnis* Günth. l. c.

*Corynopoma searlesii* Günth. t. c. p. 288 ; Lütke. l. c. fig.

Body compressed, subfusiform, the depth  $3-3\frac{1}{2}$  in the length, the length of head  $4\frac{1}{4}-4\frac{3}{4}$ . Snout much shorter than eye, the diameter of which is  $2\frac{2}{3}-2\frac{1}{2}$  in the length of head and nearly equal to the interorbital width. Mouth small, very oblique, the maxillary nearly vertical, just in front of the eye. Teeth compressed, with strong median cusp and 1 to 3 smaller cusps on each side, in 2 series in the upper jaw, 1 in the lower. Operculum, in the female, with a short pointed projection ; in the adult male with a long, slender, curved process terminating in a compressed expansion at the level of the dorsal fin. Scales 38-44  $\frac{6-7}{7-8}$ , 5 or 6 between lateral line and root of ventral ; lateral line complete. Dorsal 9-11, commencing

above about the seventh anal ray; when laid back, in the female not nearly reaching the caudal, in the adult male extending well beyond the base of caudal. Anal 25-30, commencing at or a little behind the middle of the length of the fish; last ray, when laid back, in the female not reaching the caudal, in the adult male extending well beyond the base of the caudal. Pectorals and ventrals extending to or nearly to the origin of anal; ventrals 7-rayed. Caudal deeply forked, the lobes equal in the female, the lower considerably produced in the adult male. Caudal peduncle  $1\frac{2}{3}$ -2 as long as deep. Olivaceous, with silvery reflections; a blackish stripe along the middle of the side; fins pale.

14 examples, measuring up to 45 mm. in total length.

The genus *Stewardia* was founded either on females or on very young males, with the operculum ending in a short pointed process and the fins not produced. *Corynopoma* included males of small size, with the opercular process short and the fins moderately produced, whilst *Nematopoma* was for the fully developed males. Lütken pointed out that these supposed generic differences were to be found in examples of the same species, according to the size of the specimen taken. These changes are now found to be confined to the males, and I see no reason to believe that more than one species has formed the basis of Dr. Gill's descriptions. This genus has only been recorded from Trinidad.

"The 'Swallow-tailed Sardine' is fairly plentiful in the Tacarigua River. Some have a peculiar pair of 'paddles' attached to the gill-covers, whilst others have no trace of them nor do they have the exaggerated fins which the ones with 'paddles' possess. They are caught in company and are, presumably, the same species. The scales are faintly defined, generally silvery; the back is translucent greenish."

#### 4. TETRAGONOPTERUS TENIURUS Gill. (Plate XXII. fig. 4.)

Depth of body  $3-3\frac{1}{2}$  in the length, length of head  $4-4\frac{1}{3}$ . Snout much shorter than eye, the diameter of which is  $2\frac{1}{2}$  in the length of head and a little greater than the interorbital width. Maxillary extending to below the anterior  $\frac{1}{4}$  of eye, with a more or less evident series of small teeth. Scales  $38\frac{7\frac{1}{2}}{6\frac{1}{2}}$ , 5 between lateral line and root of ventral fin; lateral line complete. Dorsal 10, with 8 branched rays, its origin a little nearer to tip of snout than to base of caudal; anterior rays longest, nearly as long as the head. Anal 29-31, with 26 to 28 branched rays. Pectoral extending beyond base of ventral; ventrals originating in advance of the dorsal, extending to the anal. Caudal forked. Caudal peduncle as long as, or a little longer than deep. Olivaceous or greenish above, silvery below; a silvery longitudinal band from operculum to base of caudal; a more or less distinct dark humeral spot; a black longitudinal band on the middle caudal rays, edged with yellow above and below.

Here described from two specimens from Trinidad, 60 and

65 mm. in total length, one received from the Copenhagen Museum as *T. trinitatis*\*. Gill's description of *T. tenuirus* is, so far as it goes, perfectly applicable to *T. trinitatis*, and there can be but little doubt of their identity. This species is known only from Trinidad.

5. TETRAGONOPTERUS GUPPYI, sp. n. (Plate XXI. fig. 1.)

"Mountain-stream Sardine."

Depth of body  $3-3\frac{1}{3}$  in the length, length of head  $4\frac{1}{2}-4\frac{3}{4}$ . Snout shorter than eye, the diameter of which is  $3-3\frac{1}{2}$  in the length of head and less than the interorbital width. Maxillary extending a little beyond the vertical from the anterior margin of eye, with a series of small teeth. Scales 38-40  $\frac{8\frac{1}{2}}{7\frac{1}{2}-8\frac{1}{2}}$ ,  $5\frac{1}{2}$  to  $6\frac{1}{2}$  between lateral line and root of ventral fin; lateral line complete. Dorsal 10, with 8 branched rays, its origin a little nearer to tip of snout than to base of caudal; anterior rays longest, shorter than the head. Anal 29-32, with 26 to 29 branched rays. Pectoral extending to or a little beyond the base of ventral; ventrals originating in advance of the dorsal, extending nearly to the anal. Caudal forked. Caudal peduncle as long as deep. Silvery, back dark greenish; traces of a dark humeral spot; a blackish longitudinal band on the middle caudal rays; caudal lobes yellow.

Five specimens, 65-85 mm. in total length.

This species is allied to the preceding and also to *T. wappi* Cuv. & Val., which has a much larger head.

"Found in clear pebbly brooks with rapid current and plentiful in the Glenside Estate Stream, at the foot of the Northern Range of hills."

6. TETRAGONOPTERUS MACULATUS L.

"Pink-finned Sardine."

"By far the commonest of the Sardines; they swarm in the Maracas River, which is clear and at times very rapid.

"Colour: Silvery, back darker; a dark humeral spot and a blackish spot at the base of caudal; fins bright pink."

*Hab.* Brazil; Guiana; Venezuela.

7. TETRAGONOPTERUS (HEMIGRAMMUS) UNILINEATUS Gill. (Plate XXII. fig. 5.)

"Sardine Dorée."

Depth of body  $2\frac{1}{2}-2\frac{3}{4}$  in the length, length of head 4. Snout much shorter than eye, the diameter of which is  $2\frac{1}{3}$  in the length of head and slightly greater than the interorbital width. Maxillary extending slightly beyond the vertical from the anterior margin of eye, with a series of minute teeth. Scales 32-35  $\frac{6-7}{5\frac{1}{2}-6\frac{1}{2}}$ ,  $4\frac{1}{2}-5\frac{1}{2}$  between lateral line and root of ventral fin; lateral line on 9 to 12

\* Lütken, Vid. Medd. 1874, p. 234.

scales only, absent posteriorly. Dorsal 10-11, with 8 or 9 branched rays, its origin equidistant from tip of snout and base of caudal; anterior rays longest, nearly as long as the head. Anal 26-30, with 24 to 27 branched rays, produced anteriorly. Pectoral extending beyond the base of ventral; ventrals originating in advance of the dorsal, extending to the anal. Caudal forked. Caudal peduncle as long, or nearly as long as deep. Olivaceous, with silvery reflections; an indistinct stripe from operculum to base of caudal; a blackish spot on the middle of the dorsal fin; an oblique blackish stripe from the origin of anal to the extremity of the third branched ray; dorsal and anal yellowish; caudal pink, with a pale margin.

Here described from two specimens, 32 and 36 mm. in total length, from Trinidad. This species has not been recorded from other localities.

"Found in drains and ravines in the high woods, Cumuto; they cruise in small shoals."

#### 8. *CHIRODON PULCHER* Gill. (Plate XXII. fig. 2.)

"Sardine Dorée."

Depth of body  $2\frac{1}{2}$ - $2\frac{3}{4}$  in the length, length of head  $4\frac{1}{2}$ - $4\frac{2}{3}$ . Snout  $\frac{1}{2}$  as long as eye, the diameter of which is  $2\frac{1}{2}$  in the length of head, interorbital width  $2\frac{1}{4}$ . Maxillary extending to the vertical from the anterior margin of eye. Scales 32-34  $\frac{5\frac{1}{2}}{4\frac{1}{2}-5\frac{1}{4}}$ ,  $3\frac{1}{2}$ - $4\frac{1}{2}$  between lateral line and root of ventral fin; lateral line complete. Dorsal 11, with 9 branched rays, its origin equidistant from tip of snout and base of caudal; anterior rays longest, longer than the head. Anal 23-25, with 21 or 22 branched rays. Pectoral extending to base of ventral; ventrals originating in advance of the dorsal, extending to or nearly to the anal. Caudal forked. Caudal peduncle as long as deep. Olivaceous; sides silvery or a silvery longitudinal stripe from operculum to base of caudal; an indistinct dark humeral spot; a blackish spot at the base of caudal, posteriorly ending in a point and margined with yellow above and below; dorsal and anal pink.

Four specimens, measuring up to 40 mm. in total length.

This species is known from Trinidad only. Found in drains and ravines in the high woods, Cumuto; they cruise in small shoals.

#### 9. *CURIMATUS ARGENTUS* Gill. (Plate XXI. fig. 3.)

"Stout Sardine."

Depth of body  $2\frac{1}{2}$  in the length, length of head  $3\frac{3}{5}$ -4. Snout as long, or nearly as long as eye, the diameter of which is  $3\frac{1}{2}$ - $3\frac{3}{4}$  in the length of head, interorbital width 2. Maxillary extending to below the nostrils. Scales 36  $\frac{5\frac{1}{2}}{6\frac{1}{2}-7}$ , 5 or  $5\frac{1}{2}$  between lateral line and root of ventral fin. Dorsal 11, with 9 branched rays, its origin nearer to tip of snout than to base of caudal; anterior branched rays longest, about as long as the head. Anal 9, with 7 branched rays, reaching the base of caudal when laid back. Pectoral extending  $\frac{3}{4}$  or more than  $\frac{3}{4}$  of the distance from its base



to the base of ventral. Ventrals 9-rayed, originating in advance of the vertical from the middle of the dorsal. Caudal forked. Caudal peduncle deeper than long. Silvery; a blackish spot on the caudal peduncle, another on the basal part of the dorsal fin; fins pale yellowish.

Three specimens, 70-100 mm. in total length.

There are examples of this species from Dominica in the British Museum collection, but it has not yet been recorded from other localities.

"Plentiful in the Ravines of the Streatham Lodge Estate."

#### 10. CARAPUS FASCIATUS Pall.

"Cutlass Fish."

"Found in the Bejucal Swamp and Cumuto.

"Colour: head and back dark olive-green; sides with alternate oblique bars of blackish and grey; anal fin blackish; head and body sprinkled with metallic specks."

*Hab.* Paraguay to Guatemala.

#### 11. ARIUS SPIXII Ag.

"A silver-grey Cat-fish, found in brackish water at the mouth of the river Caroni, where it attains a large size."

*Hab.* Brazil; Guiana; Venezuela.

#### 12. ARIUS HERZBERGII Bl.

*Hab.* Brazil; Guiana; Venezuela.

#### 13. PIMELODUS (RHAMDIA) WILSONI Gill.

Depth of body about 5 in the length, length of head  $4\frac{1}{4}$ - $4\frac{1}{2}$ . Head covered with skin, nearly as broad as long. Snout twice as long as eye, the diameter of which is 6 in the length of head; interorbital width  $2\frac{1}{3}$ . Jaws equal anteriorly; maxillary barbel extending to middle, or even beyond the end of adipose fin; outer mandibular barbel about reaching end of pectoral. Occipital process  $2\frac{1}{2}$ -3 times as long as broad, extending back beneath the skin, separated posteriorly by a distance about equal to its own breadth from the basal shield of the dorsal spine. Dorsal I 6; spine slender; middle branched rays a little more than  $\frac{3}{4}$  the length of head; free edge of the fin convex. Adipose fin commencing a short distance behind the dorsal and extending nearly to the caudal, its length  $2\frac{1}{2}$ - $2\frac{3}{4}$  in that of the fish. Anal 11, low anteriorly, rounded posteriorly, the rays gradually increasing in length to the eighth or ninth, which is  $\frac{1}{2}$  the length of head. Caudal forked; lobes of equal length, the upper pointed, the lower rounded. Pectoral spine with inner edge finely serrated, about  $\frac{3}{4}$  as long as the fin, which is  $\frac{4}{5}$  the length of head. Ventrals extending  $\frac{3}{4}$ - $\frac{4}{5}$  of the distance from their base to the origin of anal.

Back olive-green or grey; sides blackish blue splashed with whitish; lower parts white; body sometimes covered with dark

spots; fins dusky, the dorsal with a light band along the basal part.

"Found all over the island, fairly plentiful, sometimes exceeding a foot in length." Here described from two specimens of 180 and 200 mm. Known only from Trinidad.

14. *PSEUDAUCHENIPTERUS GUPPYI*, sp. n. (Plate XXIV.)

"Yellow Catfish."

Depth of body  $4\frac{1}{2}$ – $4\frac{3}{4}$  in the length, length of head 4– $4\frac{2}{5}$ . Snout not longer than eye, the diameter of which is 4–5 in the length of head and 2–3 in the interorbital width. Head nearly as broad as long; upper surface, excepting the snout, rugose, not covered by skin; frontal bones not swollen; profile rising evenly from snout to dorsal fin. Lower jaw scarcely shorter than upper; maxillary barbel extending to anterior  $\frac{1}{3}$  or middle of pectoral. Dorsal I 6; spine serrated posteriorly, as long as head. Anal 21; anterior rays longest, in the male thickened and considerably produced. Pectoral spine with serrated inner edge, as long as the head. Ventrals 8-rayed, extending to the origin of anal. Caudal forked. Upper half of body blackish green, with several vertical series of small yellowish-white spots; lower parts white, anteriorly with a dark longitudinal band; fins yellow, the dorsal dark at the base, the caudal with a blackish margin.

Caroni River.

Two specimens, 145 and 185 mm. in total length.

"Caught in numbers, especially where small streams empty themselves into the Caroni."

15. *PARAUCHENIPTERUS PASEÆ*, sp. n. (Plate XXIII.)

"Grouper Cat-fish."

Depth of body  $3\frac{1}{3}$  in the length, length of head 4. Snout as long as eye, the diameter of which is  $4\frac{1}{2}$  in the length of head and 3 in the interorbital width. Head as broad as long; upper surface rugose, not covered by skin; interfrontal fontanel oval, continued anteriorly as a narrow groove; parieto-occipital a little longer than broad, a little longer than its distance from the base of the dorsal spine; nuchal shield rounded posteriorly, its length equal to that of the basal shield of the dorsal spine (measured in the mid-dorsal line). Lower jaw somewhat projecting; maxillary barbel extending to anterior  $\frac{1}{3}$  of pectoral; mental barbel extending a little beyond the base of the post-mental, which reaches the base of the pectoral. Dorsal I 6; spine smooth except for a median anterior series of nodules, a little more than  $\frac{3}{4}$  the length of head. Anal 23, rounded anteriorly and posteriorly, slightly emarginate medianly. Pectoral spine serrated on both edges, nearly as long as the head; humeral process extending beyond the middle of the pectoral spine. Ventrals 6-rayed. Caudal obliquely truncate. Yellowish, spotted and marbled with blackish; belly white, with small greyish spots.

Caroni River.

A single specimen, 210 mm. in total length.

"Uncommon, only two specimens taken in a large pool near the Frederick Estate; they were covered with thick slime, which peeled off in sheets soon after they were put in spirit."

16. *CALLICHTHYS KNERI* Gill.

"Flat-headed Cascadura."

Depth of body  $4-4\frac{1}{2}$  in the length, length of head about  $4\frac{2}{3}$ . Head broader than long. Snout broad, rounded, its length  $3\frac{1}{4}$  in the length of head. Diameter of eye 9 in the length of head, interorbital width  $1\frac{2}{5}$ . Parieto-occipital broader than long. Inner barbel longest, extending beyond the middle of the pectoral fin. Coracoids not exposed on lower surface of body. Scutes  $\frac{23-29}{26-27}$ ; an irregular series of small scutes in front of the adipose fin. Dorsal 8; first ray a short flat spine, second simple, the rest branched, the middle rays longest,  $\frac{3}{5}$  the length of head. Anal 6, when laid back extending to base of caudal. Pectoral spine from more than  $\frac{1}{2}$  to nearly  $\frac{2}{3}$  the length of head. Caudal rounded. Brownish or greyish brown, with obscure darker spots; fins yellowish, with dark spots.

Here described from two specimens, 115 mm. in total length, from Trinidad. This fish has not yet been recorded from other localities.

"Plentiful in the Bejucal Swamp, but found all over the island. This fish can shuffle along the ground rapidly and grunts faintly when handled."

17. *CALLICHTHYS LITTORALIS* Hancock.

"Common Cascadura."

"Very plentiful in muddy swamps and also found in rivers and in ravines with muddy bottoms. In the dry season they are caught and sold in thousands, being much appreciated as food. When the water has subsided in the swamps they are easily captured by baling out the muddy pools. They can move along the ground rapidly and can live a long time out of water; when handled they make a grunting noise. This species constructs a floating nest on the top of the water, and according to Mr. Paisea they breed in the wet season in drains which dry up in the dry season; they are very savage at this period and will make an offensive display when the water is disturbed near their nests."

*Hab.* South America, from Paraguay to Ecuador.

18. *CALLICHTHYS THORACATUS* C. & V.

*Hab.* Brazil; Guiana; Venezuela.

19. *CORYDORAS AENEUS* Gill.

"Small Cascadura."

Depth of body  $2\frac{1}{2}-3$  in the length, length of head  $3\frac{1}{2}$ . Diameter of eye  $4\frac{1}{2}$  in the length of head, interorbital width 2. Profile evenly convex from snout to origin of dorsal. Lower lip free, with

a pair of barbels which are shorter than the diameter of eye; barbels at the angle of the mouth extending to the base of pectoral fin. Exposed parts of the coracoids widely separated below. Scutes  $22$ <sup>22</sup>/<sub>20</sub>, 2 or 3 unpaired ones in front of the spine of the adipose fin. Dorsal I 7; spine  $\frac{1}{2}$ – $\frac{3}{5}$  the length of head; anterior branched rays longest,  $\frac{3}{4}$  the length of head. Anal I 6, when laid back extending to base of caudal. Pectoral spine with serrated inner edge, extending nearly to or a little beyond the base of ventral. Caudal forked. Caudal peduncle much deeper than long. Head and upper part of body dark greenish; lower parts abruptly lighter; fins pale yellow, the dorsal and caudal more or less dusky.

Here described from 5 specimens, 65 mm. in total length, from Trinidad and Grenada. This fish has not yet been recorded from other localities.

20. *PLECOSTOMUS GUACARI* Lacep.

*Hab.* Paraguay to Venezuela.

21. *PLECOSTOMUS ROBINI* C. & V.

*Hab.* Montevideo; Trinidad.

22. *ANCISTRUS TRINITATIS* Gthr.

This little-known species may prove to be allied to *A. bachi* Bouleng. Apparently Lütken had a specimen of another species of this genus from Trinidad, which may be related to *A. megacephalus* Günth.

23. *XENOCARA CIRRHOSUM* C. & V.

"Bearded Teta."

*Hab.* Paraguay to Venezuela.

24. *SYMBRANCHUS MARMORATUS* Bl.

"Eel" or "Zangie."

"They live in holes or under rocks or buried in the mud and come out in search of prey, especially after heavy rain. They lie among the dead leaves at the bottom of the pools and grab at the small fry as they pass. During the wet season they may often be seen lying perfectly still at the bottom of the pools.

"Colour: greenish or yellowish, spotted with brownish."

*Hab.* Tropical America.

25. *HAPLOCHILUS HARTI* Blgr. (Plate XXI. fig. 2.)

"Small Guabin."

Depth of body  $4\frac{1}{2}$ – $5\frac{1}{4}$  in the length, length of head  $3\frac{3}{4}$ –4. Snout a little shorter than eye, the diameter of which is  $3\frac{1}{3}$ – $3\frac{3}{4}$  in the length of head, interorbital breadth  $1\frac{3}{4}$ –2. Maxillary not extending to below the eye; jaws equal anteriorly;

bands of small pointed teeth, with an outer series of enlarged teeth; on each side of the lower jaw 1 or 2 teeth of the outer series are stronger than the others, curved, canine-like. 40-42 scales in a longitudinal series. Dorsal 8-9, rounded, the longest rays  $\frac{2}{3}$ - $\frac{3}{4}$  the length of head. Anal 15-17, commencing at a point equidistant from tip of snout and extremity of caudal, ending below the middle or posterior part of the dorsal fin; rays increasing in length posteriorly. Pectoral about  $\frac{3}{4}$  the length of head or of the distance from its base to the base of ventrals. Ventrals 6-rayed, extending nearly to the origin of anal. Caudal rounded or subtruncate, a little shorter than the head; outer rays gradually increasing in length, several terminating at the upper and lower edges and comparatively few at the posterior edge of the fin. Olivaceous or greenish above; sides with bright green or blue longitudinal stripes alternating with series of dark red spots along the rows of scales; vertical fins usually orange; dorsal with 3 or 4 series of small dark spots; anal with 2 or 3 series of very small dark spots on its basal part, often with a narrow dark edge; caudal often with a blackish ocellus on the upper part of its base, sometimes with undulating striae or series of spots, sometimes with a dark edge.

Here described from 3 specimens, 60-85 mm. in total length, from Trinidad.

Three much smaller specimens from Trinidad and Venezuela were described by Dr. Günther under the name *Rivulus micropus*. The doubt which he expressed as to their identity with the *Fundulus micropus* Steind. of the Rio Negro was well founded, as these specimens show want of agreement with Dr. Steindachner's description in several important respects.

"Found everywhere and the sole occupants of the large pools worn out of the solid rock by the rapid descent of the water in a series of cascades. They are able to reach these mountain pools, which are often situated at considerable elevations, through their powers of leaping. They travel overland during wet weather. Very active and voracious; a female kept in an aquarium swallowed two good-sized 'Belly-fish' (*Girardinus guppyi*), alive and entire, one after the other. They always jump out of any vessel in which they are placed, and if the sides are too high to clear at one leap they can stick on with their fan-like tails and leap higher; when about to leap, or to make an attack, they bend their backs and drop the dorsal fin."

26. GIRARDINUS GUPPYI Gthr. (Plate XXII. fig. 1.)

"Belly-fish."

"This fish receives its name from the fact that the females usually have the abdomen distended with young. It is very plentiful, especially in such places as the 'Dry River,' at Belmont, a suburb of Port-of-Spain, where they swarm in the filthy soapy water that drains from the yards of the dwellings along the river. They save a deal of trouble by consuming the mosquito worms.

The male is a very elegant little fish and varies considerably in colour and marking.

"Colour: Male olivaceous, silvery below; a dark longitudinal stripe from eye to middle of side, another on the posterior part of the body; usually two to four blackish spots, including one at each end of the posterior stripe; these may be accompanied by reddish spots. Female olivaceous, silvery below, without spots<sup>2</sup> or stripes."

27. *DORYICHTHYS LINEATUS* Kaup.

*Hab.* Atlantic Coasts and Rivers of Tropical America, the African *D. aculeatus* being apparently distinct.

28. *AGONOSTOMUS MONTICOLA* Bancroft.

*Hab.* Fresh-waters of the West Indies (Jamaica, Barbados, St. Vincent, Dominica, Trinidad) and of Mexico.

29. *MUGIL BRASILIENSIS* Ag.

*Hab.* Cuba to Patagonia.

30. *MUGIL TRICHODON* Poey.

*Hab.* Florida to Brazil.

31. *CENTROPOMUS UNDECIMALIS* Bl., and

32. *CENTROPOMUS ENSIFERUS* Poey.

"These fishes, known as 'Broche,' 'Robalo,' or 'Snook,' were caught in the Caroni River, where they have been taken over 20 pounds in weight. They are marine, but go a long way up fresh-water streams in search of food. According to Mr. Pasea, they can be bred in artificial ponds or in large fresh-water pools that have no connection with the sea."

*Hab.* Atlantic Coasts and Rivers of Tropical America.

33. *POLYCENTRUS SCHOMBURGKII* Müll. & Trosch. (Plate XXV. fig. 2.)

"The 'King or Black Cascarob' is a very peculiar little fish, which, when alarmed, changes almost instantly from black to whitish or pinkish white, rapidly vibrates the pectoral fins, and, instead of running away, turns on one side and remains for a long time in a crouching position. They are uncommon, and were caught by means of a circular hand-net in the thick rank grass which grows at the sides of the ravines."

*Hab.* Trinidad; Venezuela; Guiana.

34. *CRENICICHLA SAXATILIS* L.

"Name 'Mulet' (pronounced Mil-lay). Head olive or greyish-green; eye with a dark crimson splash; back dull olive and yellowish green, belly greyish or bluish grey; pale green metallic spots on the sides often present, or if they be absent, blackish cross-bars; sometimes a blackish longitudinal stripe; fins varying

from yellowish to blackish blue, sometimes edged with black and white.

"Found singly or in pairs in most streams and pools and take a hook readily at times."

*Hab.* Rio Grande do Sul to Venezuela.

35. *ACARA PULCHRA* Gill. (Plate XXV. fig. 1.)

"Small Cascarob."

"This is a very elegant fish, prettily marked with bright green and blue spots and with dark cross-bars on the sides. It was interesting to see one of these beautiful fish in charge of its family of about one hundred young ones, which he or she was vigorously defending. These small fry were moving under its body, and when any other fish made an attempt to snatch one, he or she snapped viciously at the offender. This species is plentiful everywhere."

*Hab.* Colombia; Venezuela; Trinidad.

36. *CICHLIOMA BIMACULATUM* L.

"Large Cascarob."

"Plentiful in muddy rivers, ponds and swamps, but not in the clear streams."

*Hab.* Brazil; Guiana; Venezuela.

37. *PHILYPNUS DORMITATOR* Lacep.

"Taken in the Caroni River; the specimen was very docile, allowing us to handle it and making no display of resistance."

*Hab.* West Indies and Atlantic Coast streams from Mexico to Guiana.

38. *DORMITATOR MACULATUS* Bl.

"Taken at Bejucal Swamp in muddy pools."

*Hab.* Atlantic coasts and rivers of Tropical America.

39. *GOBIOUS FASCIATUS* Gill.

Body compressed, elongate, the depth 6 in the length, the length of head  $3\frac{1}{2}$ – $3\frac{3}{4}$ . Snout as long as eye, the diameter of which is 4 in the length of head. Interorbital space narrow. Cleft of mouth slightly oblique, entirely below the level of the eye; maxillary extending to below anterior part of eye; jaws with bands of small pointed teeth and anteriorly with an outer series of larger teeth; posterior tooth of outer series in lower jaw a curved canine. Gill-openings vertical, in front of the bases of the pectorals, not produced forwards below. Head and nape, thorax and lower part of abdomen naked; scales finely ctenoid, increasing in size posteriorly, about 32 in a longitudinal series. Dorsal VI, 12; rays of anterior dorsal, especially the third, produced as filaments in the male. Anal 13. Pectoral without free rays above, as long as head, extending to the origin of anal. Ventrals extending nearly to the origin of anal. Caudal rounded, rather elongate,  $\frac{1}{3}$  the length of the fish. Greenish, with dark

